



# **NAVAL POSTGRADUATE SCHOOL**

**MONTEREY, CALIFORNIA**

## **THESIS**

**SUSPENDED DRAFT: EFFECTS ON THE  
COMPOSITION AND QUALITY OF THE MILITARY  
WORKFORCE IN THE GERMAN ARMED FORCES**

by

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June 2016

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THE MILITARY WORKFORCE IN THE GERMAN ARMED FORCES**

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## **ABSTRACT**

In 2011, the German Armed Forces became an All-Volunteer Force for the first time since 1955. Less than one year after first proposed, the end to mandatory conscription became official, giving insufficient time to consider the consequences that such a drastic change in military manning methods might have on the overall effectiveness of German National Security. To date, five years later, little research exists regarding what effects the switch has had on quality of the recruit population. The thesis first considers global reasoning regarding ending conscription, especially that technological innovations in modern warfare have forever altered how we fight. Then it examines specific results of ending conscription in other countries, namely the United States. It carefully analyzes data from the German General Social Survey (GGSS) and German Micro Census to estimate difference-in-differences effects of AVF introduction on the quality and quantity of recruits as well as on the overall perception of the importance of national security among the German population. The thesis finds that, while the educational level of recruits increased, the perceived importance of national security dropped. The author recommends further data analysis as well as an information campaign, both of which would better ensure—nationally and globally—the effectiveness and strength of German National Security.

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## LIST OF ACRONYMS AND ABBREVIATIONS

ALLBUS	Allgemeine Bevölkerungsumfrage der Sozialwissenschaften [General Social Survey]
AVF	All-Volunteer Force
DWL	deadweight loss
DiD	Difference-in-differences
GAF	German Armed Forces
GESIS	Gesellschaft Sozialwissenschaftlicher Infrastruktureinrichtungen Society of Social-scientific Infrastructure Facilities]
GGSS	German General Social Survey (ALLBUS)
ISCED	International Standard Classification of Education
M/C Pay	Military/Civilian Pay Ratio
NATO	North Atlantic Treaty Organization

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## I. INTRODUCTION

*Der letztlich entscheidende Maßstab für die Bundeswehr muss die Fähigkeit zum Einsatz im Rahmen des gegebenen Auftragspektrums sein. [The ability to act in accordance with the current missions must be the ultimately decisive criterion for the German Armed Forces (GAF).]*

—Karl-Theodor Freiherr zu Guttenberg (2011)

With this statement, former German Secretary of Defense Guttenberg explains the reason for changing the composition of the German Armed Forces during the final hearing before the vote to suspend the draft. He heralds a new era where military personnel would volunteer rather than be drafted for service' (Guttenberg, 2011). Highlighting the need for military personnel that could and would better match rapidly changing technologies rather than focusing on traditional warfare, Guttenberg called for a serious change in German policy. Germany was not the first country to abolish the draft. Rather, after the West European counterweight to the Cold War was no longer necessary, the national security policies changed rapidly. (Jehn & Selden, 2002, p. 98). In order to adjust to the evolving challenges of the 21<sup>st</sup> century, one Western European country after another changed their military manning process from conscription to an All-Volunteer Force (AVF) (Jehn & Selden, 2002, p. 98). Finally, against the backdrop of a parallel financial crisis when ending conscription could mean potential budget savings, Germany officially suspended the draft in the 93<sup>rd</sup> session of the German Bundestag. On 1 July 2011, Germany officially suspended the draft ("Germany Scraps Military," 2011).

Despite such a large shift, little research has been done regarding the effects of draft suspension. While research and experience in other countries, primarily in the United States, demonstrates differences between conscription and recruitment to an AVF, the 2011 change in Germany was implemented without much research. In addition to the history and context of German

militarism, Germany's geostrategic location, right between the two European blocs, presents unique challenges, and such a large change could present parallel effects. Nonetheless, the policy was implemented without further research.

Why is research regarding the composition and quality of an AVF in Germany versus a conscripted force important? Every firm or company depends on excellent personnel because the quality of people are what separates an organization from other companies and creates their competitive advantage. The need for excellent personnel applies especially to armed forces because the service members themselves are the company's product. Changing the fundamental staffing method presents extreme challenges and brings both enormous opportunities and enormous risks. The 2011 switch from compulsory service to an All-Volunteer Force will undoubtedly alter the composition of the German military.

Some changes resulting from the AVF switch could possibly include varying the number of overall recruits and, maybe even more crucially, shifts in the quality of the recruits. Rather than an all male representative sample of the German workforce, the typical recruits for the German AVF are and will be the citizens of both sexes with the highest motivation to join the military. Whether the recruits' motivations are financial or patriotic, whether they are driven to join by a lack of other career options or by affiliation and fascination with the military profession, they will be motivated by their own reasons rather than the law. The composition of the German Armed Forces will, therefore, necessarily continue to shift along with the shift in policy. Ultimately, the shift in policy has the potential to change military manpower in terms of quality and quantity of the recruits.

Moreover, not only will German cultural perceptions of the military likely shift, the military as the authority that enforces the country's interests within the world community is one of the defining pillars of a nation. Therefore, a massive change in the military likely results in a changed country in terms of national

security, commitments, and deployments, making research and quality information crucial.

## **A. INTENTIONS OF THE SWITCH**

Although Guttenberg stated that the accomplishment of the current missions was the criterion for the decision to end the draft, another argument accompanied the call for policy change. Guttenberg also presented the possibility of saving 10 billion Euros and the elimination of the injustice of the draft (Slackman, 2010). While saving money and ending injustice may have been an argument that helped convince proponents of the draft to vote in favor of the AVF, this thesis focuses on quality and, therefore, effectiveness as the most important objective for the German Armed Forces.

## **B. THESIS SCOPE**

This thesis analyzes some of the effects of the suspended draft in order to understand the causalities and consequences of a crucial change in the manning process.

Recruits certainly shape military effectiveness and its strike capability. Thus, understanding effects of the suspended draft in terms of both quality and quantity will better enable target-oriented adaptations in the recruiting process and can lead to improved military effectiveness.

Additionally, understanding the effects on the German populace's perceptions of national security strategy can help to prevent negative consequences on a more comprehensive level.

## **C. RESEARCH QUESTIONS**

How has the quality and the composition of the GAF changed after the introduction of the AVF?

In order to focus the research, this thesis analyzes three sub-questions:

- In terms of recruit quality, have education levels of recruits changed prior to and after the introduction of the AVF?
- Have state unemployment rates impacted the quality of military recruits before and after the introduction of the AVF?
- Have societal perceptions of the importance of the military workforce and national security changed after mandatory conscription was abolished?

#### **D. APPROACH AND FINDINGS**

The following analysis is divided into two parts. To estimate the quality and quantity changes among the recruits, the thesis uses the difference-in-differences (DiD) method in multinomial logistic, linear probability, and probit models to find significant predictors regarding the probability to enlist. Micro Census data suggests that there may be a quality effect in terms of education. The proportion of recruits with an educational degree in the medium category seems to decrease in favor of the highest category, which indicates an increase in education and, therefore, quality after the introduction of the AVF. The predicted probability of secondary school (highest category) attainment among recruits increases by 0.04 after the introduction of the AVF.

The second part of the analysis is based on data from the German General Social Survey regarding the perception of importance of national security, again analyzed by application of the DiD method. Analysis of the data reveals a significant drop in perceived importance of national security among the whole population after the introduction of the AVF.

## **II. BACKGROUND**

Verdun, France, 1916: More than two million soldiers fight what will become one of the best-known battles of World War I. Not only is the Verdun battle the longest battle in history, it is also one of the most costly in terms of significant casualties, death toll, and loss of manpower on both sides. The numbers vary, but the battle certainly resulted in more than 700,000 injuries, including more than 400,000 dead (Burg & Purcell, 1998, p. 148). Obviously, the predominant mindset of the political and military leaders at that time was not driven by the urge to preserve human life.

Pakistan, 100 years later: The covert U.S. drone program in Afghanistan's border areas displays the shift in modern warfare perfectly. According to the public policy think tank "New America Foundation," during the 400+ drones strikes between 2004 and 2016, 2282–3623 people were killed (Drone Wars Pakistan: Analysis, 2016), which is less than 10% of those killed in Verdun a century before. Additionally, the technological capacity of drone strikes kept the losses on the United States' side to zero. Modern warfare can mean less death and also requires a higher level of quality in the armed forces, while simultaneously reducing the needs for quantities of soldiers.

The two campaigns illustrate the changing requirements and specific demands in manpower over the last century. The soldier in the French trenches needed a completely different (and probably less sophisticated) skillset than the drone operator, technician, or communication expert in state-of-the-art warfare.

With increased technology, the number of required servicemen has dropped significantly. A clash of millions of soldiers seems almost impossible in today's conflict theatres.

In retrospect, it seems practically inevitable to change the personnel body of the military from a gigantic conscripted force to a smaller but highly specialized

and motivated All-Volunteer Force (AVF). However, the path to suspended conscription is not that clear and straightforward.

A closer look into the history and the reasoning of the AVF is necessary before analyzing the effectiveness of Germany's 2011 drastic policy change.

## **A. THE UPRISING OF THE ALL-VOLUNTEER FORCE**

The industrial age gave rise to enormous technical—and, with it, social—change in almost every aspect of life. Traditional concepts of living were overthrown by modern and progressive techniques, methods, and inventions. Naturally, these challenges affected the world's militaries in various areas, technical equipment being the most obvious and the need for more specialized fighting forces the most consequential. Modern industry changed the way wars are fought and, therefore, altered the training and education required of a successful warrior. For the last 50 years, warfare required fewer but more highly trained and specialized users of military equipment. Advanced equipment - such as drones, missiles, and jets - gives modern armed forces the leverage to endanger far less personnel compared to the huge standing armies of the past.

In the 20<sup>th</sup> century, the idea of conscription did not become obsolete, but changing cultural perceptions influenced a dialogue regarding conscription, and, in at least one major case, public outcry caused draft policy to change. Along with the Industrial Revolution came the democratization and the idea of self-determined men. The idea of unconditional obedience to the autocratic sovereign of the country waned quickly. Mulligan and Shleifer argue that the tendency to bow to the uncontested sovereign might have decreased as power shifted to the citizens (2004, p. 4). In the same working paper, however, they also acknowledge that democratic thinking might also drive the development in the opposite direction: a notion of collective, collaborative identity might increase the willingness to fight collectively (2004, p. 4). In his 2006 book, *I Want you!: The Evolution of the All-Volunteer Force*, Bernard Rostker examines how the negative public feedback on the draft and the disapproval of the Vietnam War was, in fact,



one of the main reasons for the abolishment of compulsory service in the U.S. military (Rostker, 2006, p. 4). The end of the draft in the United States set a tone for an end to global conscription.

Conscription also naturally means a potential for less dedication among personnel, leading to potentially massive issues with unprofessionalism and inexperience. According to Rostker, the majority of the U.S. Army (before the end of the draft) had less than four years of experience. In addition to severely limited experience, available time for proficient training was also limited (2006, p. 8)

Rostker also identifies another need for the AVF from within: The huge turnover rate, which is inherent in drafted forces, led to an immense lack of professionalism: The majority (82%) of the Army had less than 4 years of experience. The inefficient use of training resources became much more than a fiscal problem. Rostker concludes that, in the late 20<sup>th</sup> century, education became more of a strategic military factor than ever. (2006, p. 8).

A large body of economics literature has discussed the merits of an AVF. Economists including Milton Friedman have argued that conscription comes with massive costs to society, paid by the draftees working below the wage they might earn otherwise and by society at large:

The real cost of manning the armed forces now, including this concealed tax, is greater than the cost of manning a volunteer force of the same size because the volunteers would be the men who find military service the most attractive alternative (Friedman, 1966, p. 100).

In an AVF, at least these opportunity costs have to be paid (by taxation), which results in a deadweight-loss (DWL). Mulligan and Shleifer show that the costs to society might be higher in universal conscription than the DWL in a voluntary system (2004, pp.4). At the same time, according to Mulligan and Shleifer, the AVF will always generate additional selection problems since the typical recruit will be the one with the lowest opportunity costs, so the preference for the AVF

only holds if the selection of the conscription is worse (Mulligan and Shleifer, 2004, p. 4).

## **B. THE PROLIFERATION OF THE AVF**

Despite the valid economics arguments above, Rostker shows that the discussion about economic benefits did not play a substantial role in the decision to end the draft in the United States. Richard Nixon, the Republican presidential candidate made draft abolishment part of his election platform and he argued that the selection process was unjust, adversely affecting certain demographic groups (Nixon, 1968). Shortly after being elected in 1968, Nixon set up the Gates Commission to underpin the need for the promised abolishment of the draft; the Gates Commission ultimately led to the United States establishing an AVF in 1973 (Rostker, 2006, p. 77).

After the United States abolished the draft, other NATO members did not immediately follow suit. There was no immediate spillover to the rest of the NATO members. It was not before the aftermath of the Cold War when most of the European countries decided to abolish or suspend the draft system as well. When the eased tensions decreased the demand for defense dramatically, it was mainly budgetary clamor that drove the European countries to downsize their forces massively (Jehn & Selden, 2002, p. 98). The reduced number of soldiers created a selection inequity among potential recruits comparable to the situation in the United States in the 1960s. By 2010, most of the major NATO players (France, Spain, Italy, Portugal, Belgium, Sweden and Netherlands) had switched to voluntary service (Jehn & Selden, 2002, p. 98).

Moreover, Friedman's arguments on inconsistency of free society and conscription did not play a noteworthy role in the discussions in Europe probably because of the continent's long history of obligated state service (Rostker, 2006, p. 5). Rather, the move toward AVF in Europe was more about the inequity of who was drafted and who was not due to the diminishing personnel sizes and the progress toward modern technology and professionalism:

Smaller, faster, more mobile, and functionally and technologically more flexible organizations, which may be integrated into multinational armed forces as well, meet these requirements much better than armies of the levée en masse type (Haltinger, 1998, p. 8).

Within 25 years after the geostrategical legitimization of mass armies of conscripts, the bigger part of Western Europe had set up AVF.

### **C. GERMANY'S SWITCH TO AN ALL-VOLUNTEER FORCE**

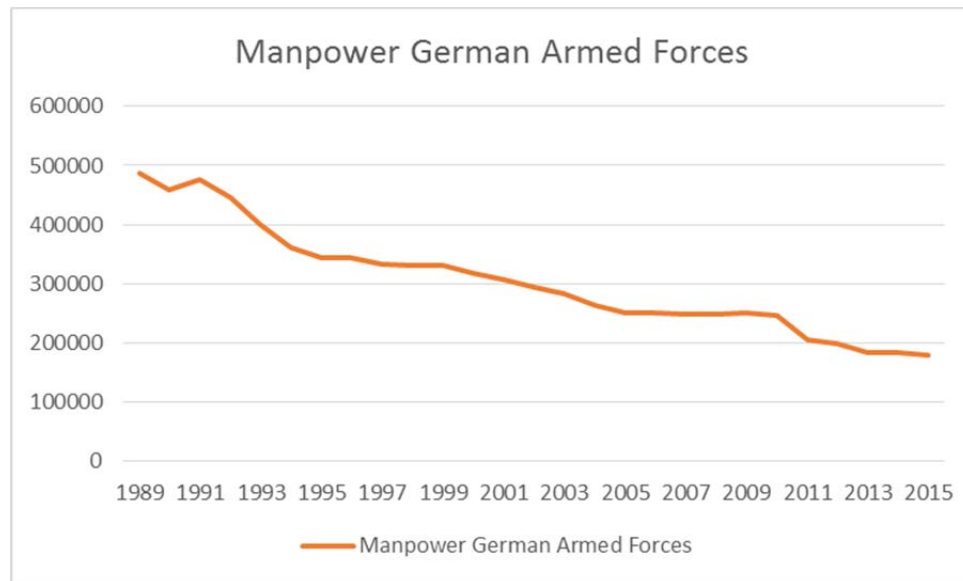
The situation in Germany was slower, to some degree because the ideal of conscription was so closely tied to German national identity. "Conscription was intended to break with the country's militaristic past and create a 'citizen in uniform' and a military linked to society and loyal to the civilian leadership" (Slackman, 2010). The historic roots of the conscription made the German government more reluctant to switch to a more efficient military even though the reality of the modern warfare abroad indicated otherwise.

When the defense minister Karl-Theodor zu Guttenberg initially proposed to end the draft in August 2010, the change did happen quickly. Only a year separated the proposal and the actual suspension of the draft. The policy change was part of a restructuring plan that also included the downsizing of the force size by 65,000 (from 250,000 to 185,000<sup>1</sup>), a smaller command organization and a more versatile strategic guideline ("Germany scraps military," 2011). The most remarkable circumstance regarding the German switch besides how long it took to start was the amount of money mentioned in the arguments. Guttenberg announced that Germany could save \$10 billion with the modification (Slackmann, 2010).

---

<sup>1</sup> The numbers had declined from 490,000 during the cold war to 310,000 in 2000 and leveled at 250,000 since 2005 (German Bundestag, 2015, p. 90)

Figure 1. Declining Manpower Numbers in the GAF (1989-2015).



Adapted from Germany, German Bundestag. (2016). *Unterrichtung durch den Wehrbeauftragten Jahresbericht 2015 (57. Bericht)* (pp. 89–90). Berlin, Germany: Deutscher Bundestag. Drucksache 18/7250.

The public and scholarly debate surrounding ending conscription was very limited in both volume and richness. Even internal stakeholders did not argue or negotiate (Hengst, 2010). The law was adopted April 15, 2011, without further delay or noticeable discussion, so the last 12,000 men were drafted January 3, 2011 (Smith, 2011).

Several explanations exist for the lack of a broader debate. The overall concept seems to be that the groundwork of various NATO partners made the idea realistic, in other words, ending conscription was no longer a revolutionary concept but the well-proven, realistic answer to substantial changes in global security. Furthermore, in the light of the European debt crisis, the proposed savings of \$10 billion might have swung public opinion toward the shift. ("Germany scraps military," 2011). Whatever the larger reasoning, from 1 July 2011, the German Armed Forces became an AVF.

#### **D. CHALLENGES AFTER THE END OF THE DRAFT**

When the United States switched to the AVF in the early 1970s, the effects were uncertain and subject to speculation. After more than four decades of experience with voluntary service, the idea has proven to be successful in almost every aspect of measurement (Rostker, 2006, p. 9) Rostker shows that the quality of the members of the military (measured in terms of recruits with a high school diploma and ability) has improved, and the military became more professional and experienced. He also finds that the concerns about the divergence of military from the general public has not been validated while the United States' military strike capability has been proven in several major wars and conflicts around the world (2006, p. 9).

However, the switch to an AVF in Germany came with different prerequisites and at a different point in time. The AVF is supposed to save money and the changing demographics (scarcity of manpower supply due to decreasing birth rates) constitute new challenges to the recruiting and setup for the German Armed Forces.

Two other challenges exist, according to Tresch, indirectly affecting the quality of recruits. Since an AVF military competes on the labor market, the armed forces run into insufficient supply of qualified personnel during prosperous times (2008, pp.77). He also notes that "conscript forces seem to have less difficulty in recruiting enlisted personnel than all-volunteer forces as the conscripted soldiers form a natural reservoir for recruiting" (2008, p. 84).

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### **III. LITERATURE REVIEW**

#### **A. OVERVIEW**

The end of conscription in the U.S. military in the late 1960s/early 1970s was a massively discussed topic not only in the public sphere but also in academic literature. The manning of a huge military force purely on the basis of voluntary commitment by its citizens requires additional incentives.

Whether the All-Volunteer Force model would be able to generate enough recruits to ensure an effective and striking force was first and foremost a question of quantity. Will there be a sufficient number of recruits, and how much would the state have to pay to maintain an adequate supply of recruits?

Nevertheless, the question of quality was not neglected. In fact, the quality of the recruits is an essential part in the model underlying the theoretical elasticity considerations.

Unfortunately, the rich public debate around the decision to end subscription in the U.S. military did not initiate a similar discussion in other Western countries that abolished the draft. So, much of our understanding of the impact of an AVF are based on U.S. studies.

#### **B. RESEARCH FINDINGS**

I grouped the literature on enlistment, conscription, and the abolishment of the U.S. draft into three big areas of gravity: the policy change itself, the European changes that followed, and the quantitative (elasticity) and qualitative (quality) perspective of enlistment.

##### **1. Enlistment Elasticity**

There is sophisticated research on the elasticity of enlistment in the U.S. Army. Asch and Hosek compare the most important post-Cold War (post-1995) studies (see Table 1), summing up the most apparent impacts on the enlistment

of high-quality army recruits (Asch, B., Hosek, J., and Warner, J., 2007, pp.1083).

Table 1. Army High-Quality Enlistment Elasticity Estimates

Study	Recruiters	Own quota	Advertising	Bonus	Ed Benefits	M/C Pay	U-rate	Cross service	College	Vets	Youth pop
W&S <sup>1</sup>	0.41					0.93	0.49				
WS&P <sup>2</sup>	0.50	0.15	0.16	0.12	0.47	1.05	0.26	-0.12	-0.87	1.44	N/A
B&S <sup>3</sup>	0.14	N/A	N/A		0.08	1.64	0.19	N/A			
HDMM <sup>4</sup>	0.29	N/A	0.02/0.03		N/A	0.55	0.18	N/A			0.50

Adapted from Asch, B., Hosek, J., & Warner, J. (2007). New Economics of Manpower in the post-Cold War era. *Handbook of Defense Economics*, 2 (1083–1084).

The elasticities in the Table are estimated with a logarithmic model as described in this chapter, thus the interpretation follows relative percentages as follows:

A 10% decrease in number of recruiters will yield a 1.4-5% decrease in enlistment. The recruiting goals (“own quota”) for the recruiters also affect the labor supply. The recruiters have to meet these goals; consequently, there is an incline in recruiting for every positive percentage change in target number of recruited personnel.

A similar causality was found for an increase of total advertising budgets and the present value of cash bonuses or education benefits. Obviously, there is a comparable relation in terms of pay (which is usually measured in the relative military and civilian pay—M/C Pay). For every percent increase in pay relative to civilian pay, there is an increase of enlisting.<sup>2</sup>

The overall unemployment rate also impacts the enlisting because the military is a reliable and easily accessible employer that attracts more people

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<sup>2</sup> What’s even more remarkable about the relative pay is the reverse conclusion: if the relative military/civilian pay declines, the labor supply declines as well even though the absolute pay might have risen.



when the unemployment rate rises. The same reasoning of demand competition applies to cross-service relationships. If all services increase their effort to increase the recruiting by 1% (for example, by increasing the advertising budget), the overall impact on recruiting numbers is negatively affected (i.e., decreased to .88%), so that the services end up competing with each other. Also, another competitor at the labor market affects the recruiting rates negatively: higher education. Every increase of college attendance among the population (aged 17–21) decreases the enlistment by almost the same percentage.

Finally, demographic aspects also impact the recruiting trends. The change in terms of the size of the potential recruit pool is the most apparent one. If the available 17–21 age span population increases, that will have a positive effect on recruiting.

Not that obvious, but still very significant is the influence of veterans within the population. The decrease of proportion of veterans older than 35 years among the population affects the recruiting negatively as well.

All the compared studies use a model developed by Dertouzos (1985, p. 12). To fix ideas, assume that the structure of the enlistment supply is:

$$\ln(H) = \delta \ln(L) + \beta \ln(X) + \ln(E)$$

$H$  and  $L$  represent the number of recruits (high and low quality),  $X$  represents the recruiting market vector, and  $E$  represents the recruiter's effort. The effort has to be represented by the respective performance-quota ratio because of its non-observed nature:

$$\ln(E) = \gamma_1 \ln(H/Q_H) + \gamma_2 \ln(L/Q_L)$$

Since high-quality enlistees are more difficult to recruit, the recruiter will maximize the utility along the production possibility frontier while having the choice between the two quality types. Thus,  $\ln(E)$  can be substituted into a

structural equation, which leads to a two equations system, or the following (reduced) equation:

$$\ln(H) = \alpha_1 \ln(L) + \alpha_2 \ln(X) + \alpha_3 \ln(Q_H) + \alpha_4 \ln(Q_L)$$

This basic approach (or marginally divergent versions) allows estimation of the original coefficients  $\delta$  and  $\beta$ . The results of the different studies using a similar approach are unsurprisingly quite consistent in outcomes within statistical variance.

The model is used to estimate the effects of exogenous market factors (unemployment, relative military pay) and recruiting resources (advertising, recruiters).

Specifically, Warner, Simon and Payne used monthly data by Service and state for the period FY88-97 to summarize the enlistment elasticities (2001, p.35). They estimate the effects on enlistment by adding state fixed effects to control for time invariant changes at the state-level (for example, specific state characteristics that lead to higher or lower recruits) and year fixed effects that control for macro-economic trends that affect all individuals in the same manner in that year (2001, pp.35).

According to Warner et al., the highest elasticity effects in terms of relative percentage change arise from the number of recruiters (0.5), the military/civilian pay ratio (0.93), veteran influence on the population (1.44) and college attendance (-0.87) (2001, pp.89). Minor effects are estimated from other factors such as education benefits, quotas, advertisement, and bonuses. Yet, the findings for the unemployment rate (0.23) are among the fairly low elasticities (2001, p. 89).

However, the amplitudes of the estimates vary among other studies. Bohn and Schmitz found the military/civilian pay ratio to be the most influential factor (1.64) in a study of the Navy college fund on recruiting (1996).

Dertouzos and Garber used nonlinear least square regression on U.S. Army lead data (1981–1984 and 1994–1996) and compared the elasticities in the 1990s with the old data in the 1980s. In their study on the effectiveness of advertisement, they found significantly different estimates for M/C pay (1.01 in the 1980s vs. -0.36 in the 1990s) and unemployment rate (0.59 vs. 0.15 in the 1990s), and they attribute the differences to the strong economy in the 1990s (2003, p. 89).

Without the crowding out effect of the strong economy, the empirical findings of the current studies are strikingly in line with the assumptions that were made by the Gates Commission's staff during the process of abolishing the U.S. draft in 1970. The process of finding the correct increase of pay in order to overcome the “manpower gap,” created by the expected lack of draftees, was elaborate (Gilman, 1970). After reviewing several studies and conducting their own research on the labor supply elasticity, the staff agreed that “the best estimate was 1.25[,] and this appears to us to be on the conservative side” (Odeen, 1971).

However, the relative numbers pretend a clear comparability that is not there. The efforts and costs to increase, for example, the number of recruiters by 10% are certainly much higher than increasing the quota by the same margin. Some of the factors are easily adjustable, while some are beyond control (e.g., youth pool population or veteran population).

In fact, the latest empirical studies suggest that the implicit assumption (that enforced conscription can easily be substituted with higher pay) does not necessarily hold in times of high demand in the labor market. (Dertouzos et al., 2003)

## **2. Enlistment Quality**

For evaluating the effectiveness of military forces, it can be even more important to analyze the quality of the recruits rather than limiting the research to the pure quantity and the conditions that actually drive these numbers. The pure

count of soldiers does not do justice to the highly specialized warfare scenarios of the last decades nor an additional factor has a determining influence on the strength of an Army: the quality of the recruits.

**a. U.S. Military**

In theory, the quality of the recruits can go two ways after switching to an AVF. Either the quality goes up because the recruits in the now All-Volunteer Force join by choice and therefore are more motivated and eager and thus more productive, or the quality decreases because people do not want to sign up for carrying the additional burdens that having less soldiers creates (such as greater risk of injury or death, less geographic mobility, or longer absences from home). The contemporary literature assumed that the latter would be the case. Thus, the academic discussion currently circles around the payoff between expensive high-quality recruits and easy to recruit low-quality enlistees (Rostker, 2006).

Arguments have been advanced that there actually is no need for high-quality recruits, a high quality recruit being “generally defined as one who scores in the upper half of the AFQT” distribution (Rostker, 2006). The payoffs were disputed broadly.

One side of the discussion was brought up by Greenberg. He argued that the additional marginal training costs in order to close the quality gap were about \$200 per man. Greenberg derived that number from reports on the “Project 100,000” a project that the United States ran from 1966 to 1971 where the military had to accept 100,000 men of the low-quality group IV each year (1969, p. 571). Greenberg divided additional training costs (\$19 million) by the number of men that passed training successfully and became regular servicemen (1969, pp.572).

According to Sullivan, the military itself naturally had an opposing view and favored high-quality personnel (1970, p. I-2-4). The four most widely presented arguments in favor were: higher requirements due to modern technology, fewer disciplinary problems, lower training costs, and higher

reenlistment rates (1970, p. 1-2-9). Recent studies also seem to confirm the need for higher qualified personnel.

Gilroy, Horne, and Smith regress individual panel data for recruits from FY74-FY84 and show that attrition is lower among high-quality personnel, and high-quality personnel also tend to be promoted faster (1991, p. 336). Warner and Asch conclude, from several meta-studies, that the productivity of high-quality personnel is higher (1995, p. 369).

However, more than 40 years of AVF in the U.S. military proved these discussions to be of pure theoretical nature because the services did not lower their quality requirements; in fact, “about 93 percent of accessions today are high school graduates, and the services take very few—in effect, no—Mental Category IV [low quality] personnel” (Rostker, 2006, pp. 6).

After all, the supply of high-quality recruits has been sufficient after abolishing of the draft although the quality level declined in the 1990s (Warner & Asch, 2001, p. 189).

#### ***b. Germany***

The German military also acknowledges the higher demand for high-quality enlistees. After the decision to shift from core defense of the country in the 1990s, the nature of the deployments changed considerably, and the demand shifted from mass army soldiers to professional, sophisticated, and interpersonal skilled experts (Apt, 2014, p. 64).

Apt notes that, before Germany suspended the conscription, it was easy to maintain a well-educated military (2014, p. 66). The amount of soldiers (conscripts and professional) with low level education (“Hauptschule”) was even lower than the average among the employed civilian population (23.9% vs. 26.3%) (2014, p. 67).

In fact, even considering that every draftee could decide to become a civilian community servant, the military conscripts had a high level of educational

attainment (76.2% middle level educational attainment—"Realschule" or above) (Apt, 2014, pp.68).

However, the German military switched to an all voluntary force only recently, evolving also from the perception of a mass army whose main purpose was to defend the Eastern border. There is not much discussion about the degree of qualification that is needed or useful.

### **3. Suspended Conscription**

The academic view on the pros and cons of an All-Voluntary Force has evolved from the pure theoretical considerations in the 1960s to empirical studies in the last decades.

The basic macroeconomic understanding during the late 1960s was that conscription came with high social costs because of the opportunity costs of the drafted recruits, who could mostly work more effectively and with a higher salary in non-military employment (Warner & Asch, 1996, p. 297).

With more and more countries switching to the AVF, the research became more detailed. Warner and Asch confirmed a higher degree of economic efficiency, especially in light of an AVF's higher productivity due to better job selection and evolved technology that needs fewer but higher skilled personnel (1996, p. 301). Nevertheless, they also showed that, with the increasing defense demand (and with it a higher force size), there is a breakeven point when conscription might be more efficient (1996, p. 302).

Mulligan and Shleifer claim that conscription might be correlated with democratization and economic development (Mulligan & Shleifer, 2005, pp. 4). "Collective-minded" people tend to commit themselves to the country which increases their compliance and willingness to serve, thus making a population in favor of drafting more likely.

Further, Warner and Asch showed that conscription might be the superior military manning method under certain circumstances (2007, p. 309). For

example, when the demand for defense is high (both in quantity and elasticity), conscription works better. In other words, in times of high tension when military conflict is likely to require large force sizes, the draft can be the economically optimal procurement method.

Mulligan and Shleifer showed that the associated costs also depend on the recruitment costs, which are subject to the political system (2004, p.3). Their proposition is based on the assumption that administration costs are probably lower if the country's bureaucracy is already well established (2004, p. 8). So, in cases with high population (low marginal fixed costs) and a legal system that has already an established administrative body, the preference for conscription is higher.

#### **4. All-Volunteer Force in Europe**

It took several decades until most Western European countries followed the United States and switched to an all-volunteer force as well. Research as discussed earlier suggests that it was not socioeconomic change that led to this trend. Two other factors led Western European governments to reconsider their military structure. First, the end of the Cold War immediately reduced the need for massive armies, and, with that reduction of need, the force size of European armies decreased by a third (Jehn & Selden, 2002, p.94).

Second, new mission design (Peace Keeping, Monitoring, or Counter Insurgency) called for fewer, more sophisticated, and highly specialized soldiers (Haltiner, 1998, p. 7). The overall efficiency of the military force combined with budgetary deliberations seem to be the driving force behind the AVF in Europe.

Nonetheless, the main focus seems to be the quantity rather than the quality of recruits: Tresch suggests that the main recruiting challenges arise for "the normal combat forces (infantry soldiers) of the army" (Tresch, 2008, p. 79).

Thus, the literature relies heavily on the U.S. groundwork and the reasoning behind the decision-making in Europe has been more of a political than emotional. In fact,

the current debate about conscription in Europe seems far less rich, informed, and contentious than the debate in the United States during the 1960s. (Jehn & Selden, 2002, p. 99)

The switch to an AVF is not completely uncharted because Germany adapted the policy rather late compared to the majority of NATO companions and the groundwork has been done long before. However, the specific German circumstances and consequences have not been taken into account in academic literature yet. This thesis studies some of these effects by analyzing public data which will be described in the next chapter.



## **IV. DATA AND METHODS**

Ideally, the underlying data would be provided and released by the GAF. Unfortunately, that data is not available for this thesis. Therefore, the analysis is limited to publicly available datasets that have to be adapted to the specific requirements of the research questions.

### **A. DATA**

The data has two parts. The first part describes the facts and figures that account for the general quality of the recruits (such as educational status, age, or unemployment prior to military service). The data regarding general quality comes from the annual German Micro Census surveys (2010-2013), described below.

The second part of the data regards the social backgrounds of the recruits. Using survey data, the thesis analyze the perception of the military in general and then identifies influential factors that drive the individual decision to sign up for military service. These analyses will be done using the biannual German General Social Survey (GGSS) from 2008 to 2014.

Therefore, the two datasets will serve as basis for two different research approaches. The Micro Census survey, with its large sample size and identifiable profession information, provides sufficient data for estimating effects on the individual potential recruit whereas the GGSS survey establishes the basis for estimations of effects on individuals within the population without considering their military background.

Both data sets have much in common. They represent annual representative cross-sectional data of the population and are based on extensive questionnaires. The data are publicly accessible. However, since the unit of observation is the individual respondent in both cases, the data was preprocessed in order to ensure the data is not individually identifiable.

## **1. The Micro Census**

The Micro Census is not a Census as such nor a smaller version of a Census in the narrower sense. It is rather an annual survey of a population sample.

### **a. General**

The German Micro Census is an annual household survey and one of the most extensive in Europe. The sample size comprises of 1% of German residents (~82 million), excluding diplomats, foreign military and homeless persons. (German Federal Office of Statistics, 2013, p. 475) The Census data sets used in this thesis have a sample size of around 800,000 observations and 700 variables.

The single-stage stratified cluster sampling bases its districts on the 1987 Census of the population and also the Population Register of the German Democratic Republic for the new federal states and East Berlin, respectively. The clusters are artificially delimited districts, usually up to nine neighboring buildings. (German Federal Office of Statistics, 2013, p. 4)

Each district is replaced every four years, so one quarter of the districts fall out of the sample every year. (German Federal Office of Statistics, 2013, p. 5) Thus, the data contains (partial) panel data which is not available for scientific use in the relevant timeframe around the suspension of the conscription in Germany in July 2011.

The survey uses computer assisted personal interviewing and self-administered questionnaires. The survey is household-based, and every member of the household is obliged to respond by law. There are no exemptions, not even for age or medical conditions (German Federal Office of Statistics, 2013, p. 5).

Anonymization restraints force the federal office of statistics to limit the scientific use files to a random 70% subsample and to remove personal

identifiers, such as names, addresses, and identification numbers. Furthermore, the office implements additional restrictions regarding regional identifiability. (German Federal Office of Statistics, 2013, p. 4)<sup>3</sup>

The focus of the survey shifts from year to year, so the number of captured characteristics varies as well, but the vast majority of questions remain unchanged for the sake of continuity. Typically, there are 700 to 800 characteristics, focusing on the demographic background of the respondents.

***b. Provided Relevant Variables***

First, the datasets include metavariables regarding the circumstances of the interview. These variables indicate the time (year) and the location (federal state) in which the interview took place.

Second, there are demographic variables such as age or gender, important to determine whether the draft is of concern for the individual respondent. Additionally, there are numerous variables with regard to the respondent's profession (status of current job, change of occupation within last 12 months) and the education (highest education degree).

Lastly, the office of statistics provides a weighting factor that adjusts the results for differences in representation and allows for more precise extrapolations from the sample to the population.

***c. Main Constructed Variable: Military Recruit***

The dataset does not identify simple military or recruit variables, so it has to be created in order to use it as dependent variable in the regressions later on. The *military variable* is coded as "1" if the profession of the respondent is a military service member. If the military job change also happened within the last year, *recruit* is set to "1" as well.

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<sup>3</sup> Notwithstanding these restrictions, the data sets are not accessible directly. The access is limited to remote access. The researcher sends the statistical commands, the statistical office applies them, controls and censors the output if necessary, then sends it back to the researcher.

## **2. The German General Survey**

Using the German General Social Survey (GGSS), this thesis examines how the change to an AVF may have influenced perceptions of military and public service. The society of social-scientific infrastructure facilities (Gesellschaft Sozialwissenschaftlicher Infrastruktureinrichtungen[GESIS]) has conducted the GGSS every other year since 1980. Containing an equally comprehensive variety of questions as the Micro Census, the GGSS focuses more on the social background, perceptions, and attitudes of the German population.

### **a. General**

The sample evolves from a two-staged (municipality, person) random sampling method based on the information of the German register of residents. Since registering is mandatory in Germany, this generates a representative and accurate sample of the German population, excluding only homeless nonregistered people and citizens living abroad.

GESIS interviewers collect the data in person via computer assisted personal interviewing and a standardized questionnaire. The respective sample size after validation and correction yields to N=3500 for every survey since 1992. Thus, the data sets are time-based series of cross-sectional surveys, available for scientific use on the GESIS website.

### **b. Variables**

Among the 800 variables in the GGSS, the data also contains important metavariables concerning the specific background of the interviewees (*age, gender, income*) as well as the survey itself (*year of the survey*).

The most appropriate question on the GGSS regarding the perception of the AVF switch is participants' response to how important they consider public order and security in the country. The possible answers are: most important (coded as "1") to less and less important (respectively coded as "2"/"3"/"4"), or no answer (coded as "."). As a result, almost every respondent has an assigned

quantitative value [1, 2, 3, 4] that indicates how they perceive the importance of public security.

A similar variable regarding the importance of free speech is included in the dataset (coded accordingly “1” as most important to “4” as least important). There is a certain degree of dependence between the two variables *public\_order* and *freespeech*, since they typically will not be most important at the same observation.

Another informative variable is *publicservice*, categorical and automatically coded to one if the interviewee works in public service.

## **B. METHODS**

The differences in nature of the two data sets and the different sample sizes necessitate two different research approaches. Because of missing job information in the GGSS data and the limited sample size in the GGSS compared to the Micro Census, the estimate of the GGSS data will not be based on individual recruit data. The GGSS data will rather be used to estimate the effect of the suspended draft on the whole population, focusing on the perceived importance of national defense.

The Micro Census data, in contrast, contains data of 501 recruits (members of the military who started service within the last 12 months). This enables regressions on the specific characteristics of the recruits and can be used to analyze the individual quality of the recruits.

### **1. Recruit Based Analyses (Micro Census)**

Since the Micro Census dataset includes a sufficient number of members of the military, it qualifies for regressions on determinants that might affect the decision to become a recruit in the GAF.

**a. *Constructing the Data for the Regressions***

The Micro Census provides a huge variety and depth of data because it addresses questions far beyond the research questions of this thesis. Therefore, the Micro Census data has to be adapted to the thesis's specific needs.

**(1) Merging 2010–2013 data**

This thesis focuses on the transition from conscription to an AVF in Germany, therefore it contains individual cross-section Micro Census data from 2010 to 2013, two years before and after the policy change.

Technically, the regression is possible with less data. Also, more points in time provide a broader data base. With only two points in time, the output could be biased by long-term trends that do not have any connection to the policy change. Controlling for this progression in time demands for the trends before and after the change, hence the regression requires at least two data points from every side of the change. Consequently, I transferred the four annual datasets (2010-2013) into one dataset that now contains the data of all four years.

The coding of the relevant variables in the data sets do not vary throughout the respective sets, so the merging does not require extensive adaptations, only minor cosmetic changes (such as labeling or matching cases).

**(2) Limiting to the Workforce**

The sample represents the whole German population, which also includes a considerable subset of people outside the workforce, mainly children and retirees. I drop these observations. The same applies to the observations that do not have a value for "type of employment."

**(3) Issue: Causality**

The effects of the suspended draft will be estimated via the "difference-in-difference" (DiD) method. The implementation of the policy is effectively a natural experiment because the exogenous event (here: suspended draft) directly affects

only a certain part of the population (here: conscripts—male teenagers between 17 and 19 years).

As a consequence, the rest of the population serves as a “control group” since they are not directly affected by the abolished conscription. In the language of program evaluation, the “treatment group,” or the group directly affected by the policy, is indicated by the variable *drafttarget* which is coded as “1” if the interviewee is male and between 17 and 19 years old.

Additionally, the difference before and after the policy change is described in the variable *postDraft*, which is coded to “1” if the survey was drawn after the policy change and zero otherwise.

#### (4) Including Unemployment Data

The data set does not provide specific unemployment rates in the area at the time of the survey, but it does provide the federal state and, of course, the year of the interview. Usually, the data could be easily connected (merged) with the respective unemployment rates. The remote access does not offer a convenient way of simple merging, so the *u-rate* variables are coded manually.

#### (5) Detecting Quality

Determining quality of a recruit is highly discussed in the literature and leads to constant changes in the report and assessment system of the armed forces. Not only is quality hard to systemically identify, it is even harder to quantify. The Micro Census, in any case, does not specify such a “quality” number. The closest information in regard to quality is the “highest level of education.” In a human capital sense, measures of completed education do indicate the potential quality of a recruit.

The survey contains education information in accord with International Standard Classification of Education (ISCED). Unfortunately, these fields are not accessible for scientific use even with remote access. So, the level of education has to be coded manually as well. The highest degree of education is recoded

into three different categories of the highest degree of education completed: *midschool* (middle school or equivalent only), *highschool* (high school or equivalent) and *secschool* (highest regular degree, which qualifies for further education at a university). Roughly, these German degrees translate in the U.S. education system to completion of 9<sup>th</sup> grade (*midschool*), 12<sup>th</sup> grade vocational school (*highschool*), and the equivalent of a U.S. high school degree is the German “Abitur” (*secschool*).

### **b. Calculations**

The analysis focuses on finding the best predictors for the decision to become a recruit in the German Armed Forces and identifying indicators of quality change among the enlistees before and after the abolished conscription.

The causal effects of the policy change are estimated via DiD. The Micro Census provides data pre- and post-policy change, so the first difference in the estimate will be denoted in the variable *postDraft* that is coded to “1” if the survey was carried out after the policy change (the draft was suspended from 1 July 2011) and “0” otherwise.

In order to avoid assigning unobserved changes over time to the policy change, the thesis also considers the difference in terms of who is directly affected by the draft (or the suspension thereof, respectively). The draft target group consists of 17–19 year old men. The draft target group, certainly the ones directly affected, serves as treatment group in this quasi-experiment. The rest of the population, in contrast, is arguably not directly affected by the policy change; therefore, the thesis treats every female and every male within the age group 20–65 as the control group.

Thus, the treatment dummy variable *drafttarget* is coded to “1” for every male individual between 17 and 19 years and “0” for every surveyed person who is female or older than 19 years.



As a result, the sample is divided into four different groups: the affected treatment group (*drafttarget* coded to 1) and the control group (*drafttarget* coded to 0) both before (*postDraft* equals 0) and after the change (*postDraft* coded to 1).

The empirical model also controls for exogenous factors that affect the probability to become a recruit. The model accounts for these factors with a variety of control variables. Specifically, the model controls for ability/education (*E*), unemployment (*U*), age, and gender (*female*).

The education (*E*) dummy variables indicate the highest degree of education (*midschool*, *highschool*, *secschool*) in order to control for different levels of ability, the unemployment (*U*) variables indicate the unemployment rate for the federal state at the survey year and whether or not the respondent was unemployed in the 12 months prior enlisting. Additionally, the variables *age* and *female* hold the age and the gender constant in the estimation.

Hence, the probability to become a recruit in the GAF is estimated as follows:

$$(IV.1) \quad Pr(\text{recruit}=1) = f(\beta_0 + \beta_1 * \text{postDraft} + \beta_2 * \text{drafttarget} + \beta_3 * \text{postDraft} * \text{drafttarget} + \beta_4 E + \beta_5 U + \beta_6 * \text{female} + \beta_7 * \text{age})$$

The categorical nature of the *recruit* variable allows not only estimation of the linear probability model but also logit and probit regressions. The results then can be compared using the percentage of correctly predicted recruits in order to find the most accurate model.

As an additional step, a similar approach will estimate the effect of the policy change on the ability of the recruits and the unemployment background. These subsequent regressions model the effect of the policy change on the highest degree of education, the unemployment rate in the home state, and the individual probability of unemployment of the recruit themselves:

$$(IV.2) \quad Pr(\text{midschool}=1 | \text{recruit}=1) = f(\beta_0 + \beta_1 * \text{postDraft} + \beta_2 * \text{drafttarget} + \beta_3 * \text{postDraft} * \text{drafttarget})$$

$$(IV.3) \Pr(secschool=1|recruit=1)=f(\beta_0 + \beta_1 * postDraft + \beta_2 * drafttarget + \beta_3 * postDraft * drafttarget)$$

$$(IV.4) \Pr(highschool=1|recruit=1)=f(\beta_0 + \beta_1 * postDraft + \beta_2 * drafttarget + \beta_3 * postDraft * drafttarget)$$

The first three education degree estimates (IV.2-IV.4) reveal if the policy change had any effect on the education background of the recruits. The results show whether suspending the draft and switching to an AVF affected the average school degree of the typical enlistee. In order to check the robustness of these estimates, the thesis also tests the effect on education using a multinomial logit regression model. IV.2-IV.4 assumes each of the education degrees are independent outcomes, while the multinomial logistic model jointly considers them as alternative choices in the education background of recruits. The variable *edu\_cat* denotes the highest degree of education (1=secschool, 2=highschool, 3=midschool) which allows a multinomial logit estimation of the difference-in-differences parameter.

The estimate of the probability of having been unemployed in the 12 months prior to enlisting (*unemployed=1*) might be an indicator for quality as well, since being unemployed suggests that the enlistee's qualities may not be sufficient to get a job in the civilian labor market.

$$(IV.5) \Pr(unemployed=1|recruit=1)=f(\beta_0 + \beta_1 * postDraft + \beta_2 * drafttarget + \beta_3 * postDraft * drafttarget)$$

The change to the AVF might also have an effect on the unemployment background of the recruits. Since the recruits enroll by choice, the policy change might attract more recruits from areas with higher unemployment rates. More recruits coming from areas with higher unemployment rates might point to lower quality and motivation because the recruits do not enroll due to preference but because of a lack of other opportunities.

$$(IV.6) \text{urate} = f(\beta_0 + \beta_1 * postDraft + \beta_2 * drafttarget + \beta_3 * postDraft * drafttarget) \text{ for recruit}=1$$

## 2. Behavioral Based Analysis (GGSS)

The previously discussed shortcomings of professional information and sample size in the GGSS data prevent an analysis of the recruits themselves. Therefore, the analysis will elaborate on the impact on the population as a whole. The estimates will focus on the change of the perceived importance of public security after the draft was suspended.

### a. Data preparations

Again, the two datasets before (2008, 2010) and after (2012, 2014) the policy change have to be merged into one datafile.

Also, some variables have to be introduced to enable the DiD. The treatment group (*drafttarget*) again contains 17–19 year old male individuals. The difference of the policy change is coded in accordance with the time of the survey (*postDraft* is coded “1” for the 2012 and the 2014 surveys and zero otherwise).

### b. Calculations

The dependent variable *public\_order* is not categorical. The respondent gave their evaluation regarding how important they perceive public security to be, and their answers are represented by values between 1 (highest importance) and 4 (lowest importance), so possible values are (1,2,3,4). The logit and probit models do not apply here because of the non-binary type of the values; the calculations are limited to the linear model, though the model stays very similar:

$$(IV.7) \quad publicorder = f(\beta_0 + \beta_1 * postDraft + \beta_2 * drafttarget + \beta_3 * postDraft * drafttarget + \beta_4 * freespeech + \beta_5 * publicservice + \beta_6 * X)$$

In this equation, *postDraft* is defined as the difference of the policy change (1 if the survey was drawn before the abolishment on 1 July 2011 and 0 otherwise) and *drafttarget* is defined as the treatment group (male, 17–19 years). Additionally, the regression controls for the “importance of free speech” (*freespeech*), being employed in the public sector (*publicservice*), and demographics, defining *X* (namely age, gender, income, and survey year).

The calculation face similar problems in terms of the huge control group from the estimates of the Micro Census data. In order to check the robustness and the accuracy, the model is verified by calculating the percentage of correctly predicted value of *public\_order* (+/- 0.5).

### **C. VERIFYING THE DATA**

The character of the data is not perfectly suitable for the DiD method. The treatment group for the Micro Census contains only 501 observations (179 in GGSS) versus the control group, unproportionally bigger (1.7 million in Micro Census and 13,068 in GGSS). The overall quality of the models is going to be affected by that, causing a noteworthy amount of variation, especially in the control group. This might lead to an extremely low goodness of fit ( $R^2$ ). The operability of the model therefore needs to be backed up by determining goodness of fit with the percentage of the correctly predicted values and checks for robustness in terms of limiting the control group to a smaller age span.

### **D. DATA SUMMARY**

Table 2 sums up the overall values of the main variables within the GGSS dataset. Most of the values are within the expected variation; only the proportion of the young male within the sample is slightly underrepresented. The percentage should be approximately 2.5 in accordance with actual age structure as reported by the German Federal Office of Statistics (2015) because the average respondent is 6 years older than the population average (45.4).

Table 2. Summary of Statistics from GGSS Data

Variable	Overall
Sample Size	12,935
Age	51.1 [39.6]
Employed in Public Service	11.80%
Income per Year in Euro	24,661 [40,906]
Importance of Free Speech	2.56 [1.08]
Importance of Public Security	2.34 [1.08]
Treatment Group (17-19yo male)	1.4%
Respondents after the Policy Change	52.7%
Female	50.2%

Statistics show data derived from 2008 to 2014 GGSS, and importance of free speech and public security are within range of 1 (most important) to 4 (least important). Standard Deviation in brackets where applicable.

The summary of the Micro Census variables (Table 3) is separated by recruits who joined the military service within the 12 months before the survey and the population in general.

Table 3. Summary of Statistics from Micro Census Survey

	Recruits	Population
Sample Size	501	1,739,344
Age	22.7 [5.6]	41.4 [13.3]
Female	5.3%	49.6%
Middle School Degree	21.3%	28.6%
High School Degree	45.4%	32.4%
Secondary School Degree	31.5%	32.6%
Unemployed 12mo ago	5.0%	4.0%
Unemployment Rate in State	7.8% [2.7]	7.1% [2.6]
Treatment Group (17-19yo male)	18.2%	2.5%
Post Draft	72.5%	67.0%

Statistics derived from Micro Census Data (2010 to 2013); standard Deviation in brackets where applicable.

Unsurprisingly, the subsample of recruits contains a smaller female proportion and represents a lower average age. The higher percentages in the target group is also expected.

Remarkably, the summary shows a higher value for high school degrees and a slightly smaller percentage of degrees in the lower education category. Also, there is a difference in the unemployment background of the respondents. Both the unemployment in the home state and the percentage of respondents that were unemployed a year previous is higher among the recruits. The thesis discusses these differences in light of the suspended draft in the next chapter.

## V. RESULTS

### A. THE IMPORTANCE OF NATIONAL SECURITY

Table 4 shows the overall distribution over the four categories of subjective importance of national security in the German General Social Study (GGSS) data. The distribution of respondents seems to be quite even over the first three degrees of perceived importance (26-29% of the sample each) and slightly lower (18%) in the “less important” category. The data does not show a clear preference for any category in the sample.

However, among the treatment group, the evaluation of the data suggests a clear preference for the third category (“less important”). The preference for public security being “less important” among the 17–19 year old male respondents is between 10% and 70% higher than in the other categories.

The last category (“public security is least important”) does not only contain the smallest overall sample size (2297). Among this subsample, the proportion of post draft respondents is around five percentage points lower than in the first three categories.

Table 4. Data by Categories of Importance of Public Security

	Importance of Public Security			
	Most Important	Important	Less Important	Least Important
<b>Treatment Group (17-19yo male)</b>	1.2%	1.5%	1.7%	1.0%
<b>Post Draft</b>	55.2%	52.8%	53.1%	48.3%
<b>Age</b>	54.2 [36.1]	51.2 [40.4]	50.0 [42.7]	47.5 [38.3]
<b>Employed in Public Service</b>	10.2%	12.1%	12.8%	12.2%
<b>Income in Euro/year</b>	24,345 [40,770]	25,941 [41,651]	25,684 [41,469]	21,651 [38,933]
<b>Importance of Free Speech</b>	2.94 [0.82]	2.65 [1.23]	2.34 [1.18]	2.15 [0.77]
<b>Female</b>	49.7%	49.3%	51.3%	50.7%
<b>Subsample Size</b>	3724	3400	3514	2297

Data comes from General German Social Survey data 2008–2014: robust standard errors in brackets where applicable.

Table 5 reports the actual results of the regressions. The first regression analyses observations within the whole workforce (age 17–65) whereas the second model is limited to the potential new employees of the armed forces (age 17–25).

Specification (1) suggests a drop of importance among the population (highly significant) and an even steeper drop for the directly affected section of the population (not significant). The control variables have a statistically significant effect that is extremely low in magnitude.

Table 5. Perceived Importance of Public Security

	(1)	(2)
<b>SAMPLE</b>	<b>ALL</b>	<b>Age 17–25</b>
<b>Post Draft</b>	<b>-0.1419***</b> [0.0414]	<b>-0.2206</b> [0.1360]
<b>Treatment Group (17-19yo male)</b>	<b>0.0703</b> [0.1487]	<b>-0.0126</b> [0.1750]
<b>DiD Treatment Group after Draft</b>	<b>-0.1343</b> [0.1811]	<b>-0.0740</b> [0.1928]
<b>Age</b>	<b>-0.0012***</b> [0.0003]	<b>0.0153</b> [0.0198]
<b>Female</b>	<b>0.0704***</b> [0.0191]	<b>-0.0761</b> [0.0703]
<b>Income</b>	<b>0.0000**</b> [0.0000]	<b>0.0000</b> [0.0000]
<b>Survey Year</b>	<b>-0.0001</b> [0.0096]	<b>0.0136</b> [0.0328]
<b>Employed in Public Sector</b>	<b>0.0079</b> [0.0290]	<b>-0.0051</b> [0.1279]
<b>Importance of Free Speech</b>	<b>-0.2783***</b> [0.0074]	<b>-0.2030***</b> [0.0254]
<b>R-squared</b>	<b>0.0818</b>	<b>0.0456</b>
<b>Observations</b>	<b>11843</b>	<b>1085</b>

Data comes from General German Social Survey data 2008–2014, (1) Age 17–65, (2) Age 17–25; robust standard errors in brackets, \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

The only control variable in the second model with noteworthy magnitude is “importance of free speech.” With every increase in perceived importance of free speech, the importance of public security drops significantly. The drop is



expected because the two political ideas are warring and a negative correlation is foreseeable.

Remarkably, after excluding the part of the population that is too old to enlist (26+ years), the second model does not support the results of the first model. Though the general results correspond with the first regression, the latter model lacks statistical significance in almost every predictor (except for the “importance of free speech”). The outcome is counterintuitive at first glance. The reason for excluding everyone older than 25 was to eliminate the possible variance within the control group. The thesis expected the younger population to be more affected by the suspended draft because they are potential voluntary enlistees. Therefore, intuitively, the older population should not add information.

On the other hand, the overall population results reflect national preferences. Voting models in economics theorizes that democratic systems or “majority rules” voting systems will select outcomes most preferred by the median voter. The median voter in Germany will be drawn from the population as a whole. Column (1) then shows a drop of 0.1419 points in perceived importance of national security for the median voter, but not necessarily for the affected subsample of potential recruits since the DiD is insignificant.

The data does not provide enough context to identify the reason for the lack of significance within the young age group. The results are perhaps distorted by an omitted-variable problem: people in the age span under 25 have been affected by the military service in a direct sense, either by having served themselves (whether they were drafted or volunteered) or by knowing someone close to them who has or still serves. It makes sense that such direct affects would have a massive impact on the way the respondent feels about public security. Depending on the recent experience with and/or in the military, the preference for public security in the age group under 25 might vary enormously.

Overall, within the population as a whole, the results reveal a significant drop in perceived importance of public security since the German switch to AVF

in 2011. The data, however, does not provide evidence for a difference between the treatment and control groups.

## B. THE QUANTITY AND QUALITY OF THE RECRUITS

The overall changes in terms of probability to become a recruit are very low in magnitude. Keeping everything else constant, the data suggests a decline of 8.33% or about 0.002 probability (see Table 6 DiD row) in the treatment group (17-19 year old male respondents) after the suspended draft relative to the control group. As expected, the treatment group of 17–19 year old males are on average significantly more likely to enlist. However, the probability to enlist (keeping everything else constant) among the target group does not change significantly with the suspension of the draft (column 2, Post Draft row).

Table 6. Probability to Enlist

	(1)	(2)
SAMPLE	ALL	Age 17–25
Post Draft	<b>0.0001</b> *** [0.0000]	<b>-0.0001</b> [0.0003]
Treatment Group (17-19yo male)	<b>0.0011</b> *** [0.0003]	<b>0.0028</b> *** [0.0004]
DiD Treatment Group after Draft	<b>-0.0024</b> ** [0.0010]	<b>-0.0017</b> ** [0.0011]
Middle school degree	<b>-0.0003</b> *** [0.0000]	<b>0.0029</b> *** [0.0003]
High school degree	<b>0.0003</b> *** [0.0000]	<b>0.0032</b> *** [0.0003]
Secondary school degree	<b>0.0001</b> *** [0.0000]	<b>0.0024</b> *** [0.0002]
Unemployment rate	<b>-0.0000</b> *** [0.0000]	<b>-0.0000</b> *** [0.0000]
Unemployed 12 months ago	<b>0.0001</b> *** [0.0001]	<b>0.0003</b> *** [0.0000]
Female	<b>-0.0005</b> *** [0.0000]	<b>-0.0042</b> *** [0.0003]
Age	<b>0.0000</b> *** [0.0000]	<b>-0.0005</b> *** [0.0000]
R-squared	<b>0.0012</b>	<b>0.0026</b>
Observations	<b>1,739,344</b>	<b>243,071</b>

Data comes from Micro Census 2010–2013, (1) Regression among population 17–65 years, (2) Regression among population 17–25 years. Robust standard errors in brackets, \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Table 6 also shows other interesting patterns. Among the aged 17–25 sample, all three categories of educational attainment significantly predict enlistment during 2010–2013. As expected, one’s employment status (or lack of employment) in the last 12 months significantly predict enlistment; so does the area’s prevailing unemployment rate. Finally, holding everything else constant, being older in age 17–25 group and being female significantly negatively affect the likelihood of enlistment.

In terms of quality, the results are understandably less straightforward. The multinomial model (Table 7) does suggest that some of the differences between the recruits pre- and post- the AVF switch in terms of highest education degree attained are statistically significant.

Using high school degree as the base outcome, the difference in lower degrees is not statistically significant (Middle School panel). Nevertheless, the odds compared to the higher education degrees are statistically significant. Holding everything else constant, the odds that a recruit in the Treatment group has a degree from a secondary school after the abolishment of the draft rather than only having graduated from high school is 2.17 times (+117% higher than) the odds for the control group prior to the suspended draft. Thus, the results suggest that the portion of higher educated recruits increased significantly after the abolishment. Combined with the earlier numbers that the size of the German military was substantially reduced during this period, these results suggest that the average quality of the German recruit has actually improved with the draft suspension.

Table 7. Multinomial Logistic Model of Education in GAF

	Coefficient	Relative Risk
<b>Secondary School</b>		
Post Draft	<b>.0067</b> [.06389]	<b>1.0067</b> [0.0635]
Treatment Group (17-19yo male)	<b>.3913**</b> [.1977]	<b>1.4789**</b> [0.2924]
DiD Treatment Group after Draft	<b>.7754**</b> [.3896]	<b>2.1715**</b> [0.1794]
<b>High School</b>	base outcome	
<b>Middle School</b>		
Post Draft	<b>.0751</b> [.0823]	<b>0.9277</b> [0.0764]
Treatment Group (17-19yo male)	<b>.2344</b> [.2480]	<b>0.7910</b> [0.3135]
DiD Treatment Group after Draft	<b>.0615</b> [.4444]	<b>0.9404</b> [0.4179]
<b>N</b>	<b>5530</b>	

Data comes from Micro Census 2010–2013; Robust standard errors in brackets,  
 \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

The results of the individual regressions (Table 8) provide some additional support to the findings of the multinomial regressions. Table 8 shows the results for the regressions (LPM, probit and logit) on each education type (equation IV.2-IV.4). Although most of the regressions do not show significant findings, the data suggests an increase of 14.8 percentage points after the suspended draft among service members who have a higher degree (secondary school), while the probability of having a high school degree slightly decreased by about 14.4 percentage points. The low significance in the logit and probit models do not corroborate these estimates, however, indicating either that there is some specification error or that each educational outcome cannot be independently modeled. In either case, the multinomial logistic regression is the most reliable of these estimates as it allows for the joint correlation between education categories as alternative choices among enlistees before and after the switch to the AVF.

Table 8. Highest Education Degree Regressions

	(1)	(2)	(3)
<b>Middle School</b>			
Post Draft	<b>0.0096</b> [0.0107]	<b>0.0469</b> [0.0413]	<b>0.0848</b> [0.0748]
Treatment Group (17-19yo male)	<b>-0.0004</b> [0.0318]	<b>0.0191</b> [0.1235]	<b>0.0343</b> [0.2211]
DiD Treatment Group after Draft	<b>-0.0483</b> [0.0657]	<b>-0.1775</b> [0.2326]	<b>-0.3152</b> [0.4084]
<b>High School</b>			
Post Draft	<b>-0.0083</b> [0.0143]	<b>-0.0342</b> [0.0344]	<b>-0.0546</b> [0.0550]
Treatment Group (17-19yo male)	<b>-0.1018**</b> [0.0421]	<b>-0.248**</b> [0.1062]	<b>0.3976**</b> [0.1713]
DiD Treatment Group after Draft	<b>-0.1480**</b> [0.0821]	<b>-0.3315</b> [0.2040]	<b>-0.5309</b> [0.3267]
<b>Secondary School</b>			
Post Draft	<b>-0.0035</b> [0.0136]	<b>-0.0028</b> [0.0355]	<b>-0.0045</b> [0.0579]
Treatment Group (17-19yo male)	<b>0.0566</b> [0.0426]	<b>0.1311</b> [0.1061]	<b>0.2125</b> [0.1713]
DiD Treatment Group after Draft	<b>0.1437**</b> [0.0743]	<b>0.3559*</b> [0.2151]	<b>0.5848</b> [0.3581]

Each panel is a separate regression. Data comes from Micro Census 2010–2013, Probability to have a particular degree in education, given that the respondent is a member of the military. (1) LPM, (2) Probit, (3) Logit Model; Robust standard errors in brackets, \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Using estimates from column 1 (LPM), the predicted probability of secondary school (highest category) attainment among recruits increases by 0.04 after the introduction of the AVF. In contrast, the predicted probability of the lowest education category increases by only 0.02 after the introduction of AVF.

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## **VI. CONCLUSIONS, RECOMMENDATIONS, AND FUTURE RESEARCH**

The decision to switch from conscription in the armed forces to an All-Volunteer force (AVF) is one of the most far-reaching transitions for a military, because it changes its very core by changing the composition of the personnel. The aftermath can be severe and extensive.

The research questions seeks to estimate effects in two different areas. Primarily, the research focuses on personnel effects regarding the composition and quality of the military recruits after the introduction of the AVF in 2011. The thesis used data from the German Micro Census survey, including *education*, “*unemployment before enlisting*,” and the *unemployment rate* as proxy variables to determine the quality of the recruits. The models for the regressions made use of the difference-in-differences (DiD) method, using the subsample of 17–19 year old males as treatment group because they are the typical draft target group (making them the most directly affected by the switch to the AVF among the German population).

Secondarily, the thesis analyzed the effect of the suspended draft on the whole population in terms of perception. The underlying research question was whether the societal perceptions of the importance of the military workforce and national security changed before and after the end of mandatory conscription in Germany. The data of German General Social Survey (GGSS) contains the evaluation of how important the respondents value national security. The thesis used a similar DiD approach with the GGSS data to analyze the effects on the general population.

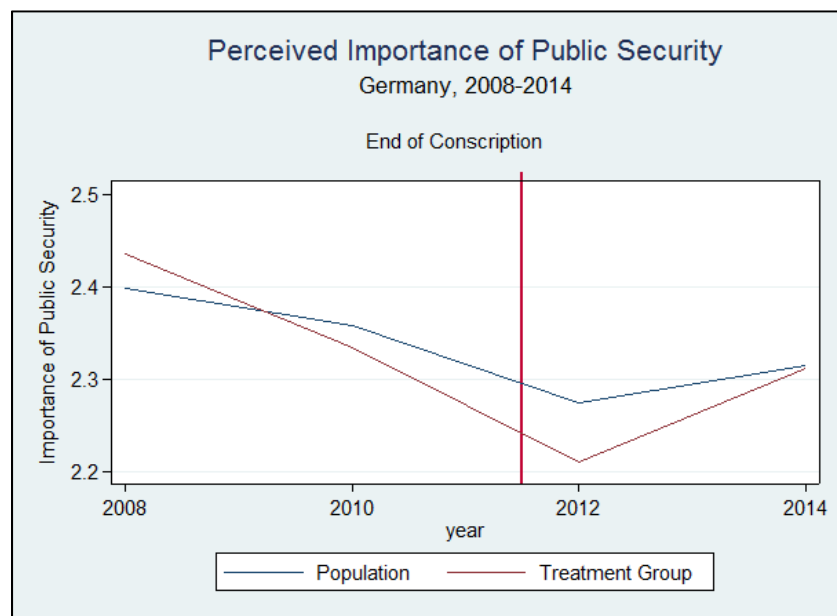
### **A. CONCLUSIONS**

The results of analyzing GGSS data suggest that the abolishment of the draft had a significant effect that is not limited to the directly affected part of the population (treatment group). Surprisingly, the perceived importance of national

security dropped among the population as a whole. Though the dataset points at the introduction of the AVF as the reason for the drop in perceived importance of national security, the statistical significance is not sufficient to rule out other influences. Regardless, there is a significant drop in perceived importance after the abolished draft (shown in Figure 2).

Warner and Asch were able to show that less need for national security (as a proxy for a lower demand for defense) favors the AVF (2007, p. 309). Thus, by lowering the demand for defense, the abolishment of the draft became self-reinforcing.

Figure 2. Perceived Importance of Public Security in Germany over Time (2008-14)



Data comes from the 2008–2014 GGSS. The downward trend applies to both the whole population and the treatment group (17-19 year old male).

In addition to the possibility that the switch to an AVF in Germany lowered the importance of national security as a priority in the eyes of the German national population, it is important to keep in mind that other world events also affect perception. The tension surrounding Crimea in 2014, for example, in



addition to other recent events in Eastern Europe, show that German national security remains as important as ever. Whether the switch to an AVF in Germany lowered the national perception under an appropriate level remains to be seen, and further research should be done regarding the perception of national security's importance.<sup>4</sup>

At the same time, the Micro Census data indicated a positive development in terms of personnel quality. The proportion of the recruits who have a high school degree when enlisting significantly drops in favor of the superior secondary school degree (almost 15 percentage points). This leads the author to conclude that the quality of the recruits increased after the switch to the AVF. The reasons for the increase in quality might also be in context with the parallel reduction of forces and the reorganization of the GAF. Interestingly, the proportion of lower educated recruits does not change significantly which points to a structural change rather than to a uniform trend caused by the new form of manning.

## **B. RECOMMENDATIONS**

The perceived decrease regarding the need for defense has to be addressed because that would result in severe consequences for the effectiveness of the German military. If they are not seen as crucial, they would potentially receive less funding as well as potentially less recruits. The perception that there is less demand for defense might keep the forces from switching back to conscription early enough in the event of a severe crisis, even if the switch would be the more effective option. Based on the results of the research contained here, as well as the overall background information regarding the German Armed Forces, I recommend an information campaign designed to clarify the reasoning for the switch to the AVF. The population needs to know that the change did not happen because no military threat exists, but rather the

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<sup>4</sup> In fact, the slight increase of perceived importance of national security in 2014 (see Figure 2. ) might derive from the Crimea crisis.

opposite. Understanding that modern warfare demands a more flexible, highly trained, excellently educated, and exceptionally professional military is crucial for the German population so that they are adequately informed and prepared and expectations are aligned.

The rising level of quality among the personnel is a beneficial outcome of the change toward the AVF and can be highlighted in an informational campaign. From the quality perspective, the switch to an AVF was a valuable policy change. Nevertheless, the different education degrees are not only a manifestation of quality; the type of education also represents a different kind of skill set that is promoted to the students. Thus, a higher degree is not necessarily a better degree. Intellectual skills are vital on the modern battlefield, but the need for practical abilities persists. Aptitude tests may make better sense in measuring recruit quality. While the shift toward higher educated recruits benefits the GAF, the concurrent reduction of forces comes at the expense of recruits with high school degrees. The GAF could make efforts to spread the decrease evenly among high school and middle school graduates for the sake of diversity, distribution of skill sets and functionality of the force.

### **C. FUTURE RESEARCH**

The causality between the manning system (draft vs. AVF) and the demand for defense needs further examination using a broader data base from more countries that changed to AVF or vice versa that also covers times of changing military tension (e.g., the end of the Cold War and 9/11). The research should also determine if there are other factors that have an effect on defense demand in order to contain the negative effect. Finally, it would be interesting to note if the drop in perceived importance of national security among the German population changed with more recent events (e.g., influx of asylum seekers, ISIS terrorist incidents in Europe).

The analysis regarding the different education degrees is only an approximated measurement of quality. The regressions here merely scratch the

underlying causalities. The various causes for the trends might still be hidden in the data. If the actual connection is structural, it can only be revealed with structural (internal) data. The quality of the recruits can be analyzed at a more detailed and more specific level (according to rank, specialty, and service) with the internal data from the GAF. In order to understand the true picture and needs for German national security going forward, the internal data needs to be analyzed in order to tailor the recruiting process to the specific needs of the GAF.

Further, trends in recruit quality should be observed over a longer period of time. This thesis only covers the two years after the draft was abolished. During that two years, no decisive challenge to German national security occurred. More research that considers long term trends and more specific data regarding the manning methods of armed forces, together with an information campaign focused on disseminating information about the changing scope of modern warfare, will greatly aid in assuring German national as well as global security.

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